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SELF-LEVELLING UNDER-PACKING FOR PRINTING PRESSES

The present invention relates to under-packing for printing presses, particularly offset.

With particular but non-exclusive reference to offset printing presses, these basically comprise three cylinders: the plate cylinder, the blanket cylinder covered with rubber-coated fabric, and the impression cylinder. Below the said covering, the blanket cylinder comprises traditional under-packing formed: from individually removable (incompressible) gauged paper sheets for adapting the working diameter of the cylinder, and a separate under-blanket generally consisting of elastically compressible polybutadiene.

For levelling purposes, it is already known in the printing press sector to also use, as under-packing, polyester films coated with adhesive on one side.

The drawback of using paper and polyester is that both are rigid (hence not properly self-levelling), the former also not being fire-retardant.

From another patent of the same applicant (European patent 1,323,527), it is already known to use as under-packing a series of sheets (of paper or polyurethane) joined together by known pressure sensitive adhesive which enables the individual sheets to be removed to adapt the under-packing (of rubber-coated fabric) to the required thickness.

An object of the present invention is to provide under-packing for printing presses which is able to satisfy a large series of requirements which the current art only partially satisfies; more precisely the under-packing of the invention is able to satisfy the following requirements: ecocompatibility, flame retardance, resistance to solvents and to mechanical stresses, excellent machinability, long life, considerable versatility of use, excellent adaptation to the cylinder and resilient

elasticity, better constructional geometry of the point of printing, considerable screen spreading uniformity, better printing stability.

This and further objects which will be more apparent from the ensuing detailed description are attained by an under-packing for printing presses in accordance with the technical teachings of the accompanying claims.

The invention will be more apparent from the following detailed description, provided by way of non-limiting example, of some preferred embodiments thereof presented in the form of examples on the basis of the following schematic figures from 1 to 3, all showing sections through different versions of under-packing of the invention.

The under-packing of the invention (always indicated by 1) consists in its most general expression of a composite comprising a non-elastic part (defined as rigid for simplicity) indicated by 2 formed from a film based on high-limpidity polyester (PES) (for example transparent antinewton polyester, the term "antinewton" indicating that it has been slightly roughened by physical treatment to facilitate bonding to the other layer) as produced by POLICROM Inc., of Bensalem, Pennsylvania (USA) and by Toray, Japan), and an elastomeric covering 3 (on one side of the PES film) based on polyurethane and/or thermoplastic polyurethane (for example the products known by the name Estane 54660 and 58271 of NOVEON Inc., USA).

On the opposite side to that with the elastomeric covering, the composite can present one or more strips of adhesive, or be completely adhesive-coated, with products of known type enabling facilitated attachment and detachment (pressure sensitive). For connection to the metal surface of a cylinder or of a "metal blanket", the adhesive, as already stated, will involve the whole surface in question. The adhesive is indicated by 4 in Figure 1.

The composite can be obtained by known covering methods for producing composite film, for example by blade spreading, by calendering, by coextrusion or a combination of calendering and coextrusion.

The thickness of the applied elastomer can vary from a minimum of 20 μm up to 1000 μm (for each layer, with a maximum of three layers in the case of a composite with more than one layer inseparably joined together).

The thickness of the polyester based film can vary between 40-100 μm (with one side totally adhesive-coated and including not more than 5 μm of adhesive in its thickness) and between 50-350 μm (without adhesive coating) or with partial adhesive coating along an edge strip.

The examples are as follows:

EXAMPLE 1

A polyester based film of 40 μm thickness totally adhesive-coated on one face (protected by a removable silicon-coated film) is covered on its non-adhesive side in known manner (blade spreading) with a 100 μm thickness of elastomer based on high solid polyurethane in DMF (dimethylformamide) solvent.

The adhesive is of the kind known as attach/reattach known as pressure sensitive.

In particular the chemical/physical characteristics of the polyurethane are the following:

Shore hardness A	75-95	DIN 53505
Density g/cm^3	1.10-1.25	DIN 53479
Cyclic compression %	60% compressible	DIN 53517
Resilience %	30-40	DIN 53512
Solvent resistance	resistant	

The test consisted of carrying out a cycle of one million compressions (of 60% on the compressible side) without undergoing any thickness decrease in 5 cm

elastomeric discs subjected to 60% compressive load on the elastomer side with preload of 2N, cycle frequency 20Hz.

EXAMPLE 2

Using the calendering method, a polyester based film of 40 μm thickness is covered on one side with an elastomer layer (based on high solid polyurethane) of 160 μm thickness. Reference should be made to Example 1 for adhesive-coating details.

EXAMPLE 3

Using the known coextrusion method, a 100 μm polyester based film is combined with a 100 μm film of elastomer based on thermoplastic polyurethane.

EXAMPLE 4

A 625 μm elastomer layer based on thermoplastic polyurethane is applied by calendering to a 175 μm standard polyester based film.

EXAMPLE 5

The composite is formed from a 350 μm polyester based film and a 450 μm blade-spread layer of polyurethane based elastomer.

EXAMPLE 6

The composite is formed from a 500 μm polyester based film and a 1000 μm calendered layer of polyurethane based elastomer.

EXAMPLE 7

A 300 μm layer of polyurethane is applied (by blade-spreading) onto a first layer formed from a 175 μm polyester based film.

A 50 μm polyester based film is then applied (by calendering) to the polyurethane layer, followed (by calendering) by a 255 μm elastomer layer (thermoplastic polyurethane), then finally by a 20 μm layer of thermoplastic polyurethane of different characteristics, for example hardness.

EXAMPLE 8 (Figure 2)

A first composite - obtained by calendering is formed from a 175 μm film (2a) of polyester, and a 600 μm polyurethane elastomer layer (3a) - is calendered on a second identical composite again formed from a 175 μm film (2a) of polyester, and a 600 μm polyurethane elastomer layer (3a). The result represents a different requirement of the user which is satisfied with a simple combining of two identical composites, i.e. of the same composite.

EXAMPLE 9 (Figure 3)

A coextruded and calendered multi-layer composite formed from a 350 μm first polyester film (2b), a 600 μm layer of thermoplastic polyurethane elastomer (3b), a 50 μm second polyester film (2b) and a 550 μm second polyurethane elastomer layer (3b).

EXAMPLE 10

At least one 50 μm polyester film coated with pressure sensitive adhesive (i.e. detach/reattach) is applied to a composite comprising a 225 μm polyurethane film and a 175μm polyester film. Instead of one adhesive-coated film, two or three can be used stacked individually and removable for thickness adaptation purposes.

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The scope of the invention also includes traditional methods for combining several composites together to obtain a resultant composite of adequate thickness possessing the required chemical/physical characteristics.